General Physics

HEAVY METAL CONTAMINATION DETECTION NEAR A FORMER MAGNET PLANT

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X-ray fluorescence (XRF) is a technique to determine elemental composition of materials and has sensitivities to the parts-per-million level. XRF occurs when a radioactive source stimulates x-rays from the sample under analysis. These x-rays can identify and quantify the elements of the sample. Using this principle, soil samples from the vicinity surrounding the former VAC Magnet Plant in Elizabethtown, KY were analyzed. A ^{109}Cd gamma-ray source was used in tandem with a lithium drifted silicon x-ray detector to determine the composition of each sample. Each sample was analyzed to determine if it contained any heavy metals. XRF spectra indicated the presence of high concentrations of lead and nickel. Since lead is a known biohazard, the most highly contaminated soil sample was given to the Materials Characterization Center for analysis of the lead concentration. Lead concentrations were found in excess of 2460 ppm in this sample. We are still investigating whether these limits violate any state or Federal statute.